What is claimed is:

1. A method for coating an implant comprising the steps of

(a) contacting the implant with an aqueous solution of magnesium, calcium, and phosphate ions;

(b) passing a gaseous weak acid through the aqueous solution;

(c) degassing the aqueous solution; and

(d) allowing the magnesium, calcium, and phosphate ions to precipitate onto the implant to form a coating.

2. The method of claim 1 wherein the gaseous weak acid is carbon dioxide.

3. The method of claim 1 wherein the implant is formed from one or more of metal, organic material, polymer or ceramic.

4. The method according to claim 1 wherein the calcium and phosphate ions are present in the aqueous solution in a molar ratio of between about 1 to about 3.

5. The method according to claim 1 wherein the calcium and phosphate ions are present in the aqueous solution in a molar ratio of between about 1.5 to about 2.5.

6. The method according to claim 1 wherein the aqueous solution comprises about 0.5 to about 50 mM calcium ions and about 0.5 to about 20 mM phosphate ions.

7. The method according to claim 1 wherein the aqueous solution comprises about 2.5 to about 25 mM calcium ions and about 1.0 to about 10 mM phosphate ions.

8. The method according to claim 1 wherein the aqueous solution comprises about 0.1 to about 20 mM magnesium ions.

9. The method according to claim 1 wherein the aqueous solution comprises about 1.5 to about 10 mM magnesium ions.

10. The method according to claim 1 wherein the aqueous solution comprises no carbonate ions or less than about 50 mM carbonate ions.

11. The method according to claim 1 wherein the aqueous solution comprises no carbonate ions or less than about 42 mM carbonate ions.

12. The method according to claim 1 wherein the aqueous solution comprises an ionic strength in the range of about 0.1 to about 2 M.

13. The method according to claim 1 wherein the aqueous solution comprises an ionic strength in the range of about 0.15 to about 1.5 M.

14. The method according to claim 1 wherein the gaseous weak acid is passed through the aqueous solution at a pressure of about 0.1 to about 10 bar.

15. The method according to claim 1 wherein the gaseous weak acid is passed through the aqueous solution at a pressure of about 0.5 to about 1.5 bar.

16. The method according to claim 1 wherein the aqueous solution has a temperature in the range of between about 5°C to about 80°C.

17. The method according to claim 1 wherein the aqueous solution has a temperature in the range of between about 5°C to about 50°C.

18. The method according to claim 1 wherein the implant is treated by a mechanical or chemical surface treatment prior to contacting the implant with the aqueous solution.

19. The method of claim 18 wherein the implant is treated by sand-blasting, scoring, polishing or grounding.

20. The method of claim 18 wherein the implant is treated by contacting with strong mineral acid or an oxidizing agent in a manner to etch the implant.

21. The method of claim 1 wherein the coating comprises magnesium ions, calcium ions and phosphate ions and one or more ions selected from the group consisting of hydroxide, carbonate, chloride, sodium and potassium.

22. The method of claim 1 wherein the coating comprises one or more of amorphous carbonate calcium phosphate, hydroxyapatite, calcium deficient and hydroxyl carbonate apatite, octacalcium phosphate, dicalcium phosphate dihydrate or calcium carbonate.

23. The method of claim 1 wherein the coating has a thickness of about 0.5 to about 100 microns.

24. The method of claim 1 wherein the coating has a thickness of about 0.5 to about 50 microns.

25. The method of claim 1 further comprising the step of contacting a coated implant with a calcifying solution comprising calcium and phosphate ions, and allowing a precipitate layer of calcium and phosphate ions to form on the coated implant.

26. A device for coating an implant comprising

(a) reactor vessel;

(b) heating element operatively connected to the reactor vessel;

(c) implant support;

(d) stirrer disposed within the reactor vessel;

(f) inlet and outlet operatively connected to the reactor vessel; and

(g) controlled source of carbon dioxide operatively connected to the inlet.

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